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DEPARTMENT OF AGRICULTURAL EDUCATION

ELEMENTARY VOCATIONAL AGRICULTURE

FOR

MARYLAND SCHOOLS

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LESSONS OUTLINED BY MONTHS
SEPTEMBER

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Maryland Agricultural College

AND

Experiment Station

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Introduction.

This is the first of a series of publications, one for each school month, setting forth lessons in elementary vocational agriculture for the public schools of Maryland. These lessons are outlined after a monthly sequence plan and are intended to be adapted to the seasonal, agricultural, and school conditions of Maryland. It is hoped that by presenting lessons in the subject of agriculture at the time the principles in these lessons are practiced or should be practiced on the farms of the community two things may be accomplished; namely, the classroom work may be greatly vitalized by having timely material at hand for practical work and the things that are best to do on the community farms are taught at the time they should be done.

The lessons are developed quite fully, but in addition to this references are made to the textbooks most commonly used in the State as class assignments and to the available publications of the United States Department of Agriculture and the Maryland Agricultural College as teachers' reading. By carefully studying the reference literature the teachers are able to supplement the lessons outlined to the advantage of the pupils.

After making a careful study of school conditions in the State it is recognized that only a limited number of lessons in agriculture can be taught by the greatly burdened teachers, hence these outlines contain ordinarily two, and never more than three lessons a week. It is considered advisable to combine the sixth and seventh grades in agriculture and some other subject as physi-

ology, and alternate the lessons in these subjects. That is, when two lessons in agriculture are provided for a week, assign three lessons in physiology, and when three lessons in agriculture are provided, assign two lessons in physiology. In this way the work may be carried on and still not overburden the teacher's schedule.

The practical exercises suggested take the direction very largely of club activities or home projects. It is urged that the teachers emphasize this phase of the work and in making up class records give it equal weight with the recitation grade. Teaching agriculture and correlating it with other subjects cannot be made effective unless the pupil demonstrates the principles taught in some kind of farm project and utilizes the project experiences in vitalizing the other subjects in the school course.

The correlation exercises set forth in connection with each lesson are largely suggestive. These are intended to indicate how the teacher may take advantage of the experiences and problems the pupils meet with in their club or project work to give vitality to the subjects of English, arithmetic, geography, history, drawing and the like.

LESSON ONE.

Subject: Soil.
Topic: Winter Cover Crops.

Purpose.—During the summer and early fall much unused plant food is made available in the soil by the action of bacteria or small plant life organisms. If such soil is left unprotected during the fall and winter months the weathering agencies leach out and wash away this available food. There are certain hardy plants that may be grown on the land during the fall, winter and early spring. These utilize the available plant food, protect the land from washing by forming a mass of roots in the soil and a coat on its surface, provide grazing for farm animals during the fall and early spring and return plant food to the soil when plowed under in the spring.

Kinds of Cover Crops.—There are two general classes of cover crops adapted to Maryland conditions; namely, small grains and grasses such as rye, barley, oats, wheat and timothy, and legumes,

such as crimson clover and vetch. In all sections of the State where wheat and grasses are grown they form a winter cover for the land. These crops usually follow corn or sod. Rye, barley, oats, vetch and crimson clover may be used as a winter cover for land that has produced a crop of corn, tomatoes, potatoes or the like. Rye, barley and vetch are preferable in western and northern Maryland, and crimson clover and oats in the southern portions of the State.

Dates of Seeding for wheat and timothy range from the middle of September in the mountain section to the first of November in the southern parts of the State. The same is true of rye, barley and oats. Crimson clover and vetch should be sown at least a month earlier where practicable to do so.

Rates of Seeding.—Wheat and timothy: wheat 1 to 1½ bushels, timothy 10 pounds; rye 1 to 1½ bushels; crimson clover 12 to 20 pounds, depending on the date of planting. The later the planting, the more seed should be used. Vetch 25 to 30 pounds with 1¼ bushels oats, ½ to ¾ bushel rye, or ¾ to 1 bushel wheat.

Methods of Seeding.—Wheat and timothy, rye, vetch and grain, barley, oats, and clover should be seeded with a grain drill—one-horse if in standing crop, two-horse if on open land. When crimson clover is hand seeded the land should be previously prepared and the seed should be lightly covered.

Inoculation.—If crimson clover and vetch are sown in fields that have not produced these crops before, inoculation is necessary to insure the success of the crops. Take soil a spade deep from fields that have produced these crops and broadcast it over the fields to be seeded at the rate of about two bushels of soil per acre and harrow in immediately to prevent sunlight killing the bacteria.

Textbook References.—Burkett, Stevens and Hill, pp. 192, 213, 215, 249, 254; Davis, p. 148; Nolan, p. 44; Buffum and Deaver, pp. 83, 95, 97, 114, 118.

Teachers' Reading.—Farmers' Bulletins Nos. 326 and 427.

Practical Exercises.—(1) Take pupils of the class to nearby field where a leguminous crop is growing. Carefully remove plants from the soil. Note: (a) the mass of roots, (b) the nodules or tubercles. Examine in the same way one of the plants that does not belong to the leguminous group. Note the difference and emphasize the fact that nodules are the homes of

the bacteria that collect nitrogen, the most expensive element of plant food.

(2) Require each pupil of the class to bring to school at least one each of leguminous and non-leguminous plants. Examine and compare the root systems and the nodules produced.

Correlations.—Language: have each pupil of the class write a description of a leguminous plant including such points as, depth to which roots grow, appearance of nodules, height of plant, kinds of blooms, seed cases and seeds, if any. (See Department Bulletin No. 132.)

Drawing: Sketch roots of leguminous plants showing the tubercles.

Geography: Trace the water that falls on the farms of the community into the branches, creeks, and rivers on to the sea. If cover crops are not sown the farms along the streams are enriched at the expense of those of the community.

Arithmetic: Develop problems on the cost of the seed used at the homes of the pupils in sowing cover crops. Base the calculations on the rates of seeding suggested in this lesson and on local prices of seed.

LESSON TWO.

Subject: Green Feed.
Topics: (1) Silage, (2) Forage Crops.

Crops Used.—Corn is the principal crop employed in making silage but it may be supplemented by such fallow crops as peas and soybeans.

Stage of Cutting Crop.—Corn for silage should be cut somewhat earlier than for grain. The grains should be dented and slightly glazed, but soft enough to be pressed in with the thumb. The time for cutting is indicated by the shucks beginning to turn brown. Peas and soybeans may be cut any time after they begin putting on pods.

Chopping the Materials.—All materials should be cut into lengths from $\frac{1}{4}$ inch to $\frac{1}{2}$ inch long. Finely chopped silage admits of thorough packing. This excludes the air and insures keeping qualities. The most economical type of silage cutter is one that is connected with a blowing device. This forces the silage into the silo as it is cut.

Packing the Silage.—One or two men should be stationed inside of the silo to pack the silage thoroughly as it is forced in. Special care should be taken to see that the packing is done thoroughly around the walls. If cutting is deferred until the material becomes dry, three or four buckets of water to each load should be sprinkled on silage as it is being packed. The air must be very largely excluded if the silage is to be preserved uniformly.

Fitting Doors and Covering Silage.—The doors should be covered with a sheet of building paper and forced firmly into position. When the silo is quite full a covering to exclude the air should be provided until it is time to begin feeding the silage. Fine trash or chaff well moistened and sowed down with some oats forms a mat that excludes the air.

Feeding Silage.—After the silo is opened not less than two inches of silage should be fed each day. Five square feet of surface should be fed to a cow each day. If silage around the walls of the silo becomes frozen, it should be piled up in the middle to thaw.

Forage Crops.—If the instructions given in the lesson on cover crops are followed fall and spring grazing is provided for. In western and northern Maryland the wheat stubble may be utilized for light fall grazing. Both rye and crimson clover provide grazing for the early spring months.

Hay is provided in those parts of the State where timothy and clover are grown. Alfalfa is one of the most valuable hay crops and August and September are the months for seeding in all of Maryland except the mountain section. Midsummer seems to be the best time for sowing alfalfa in the mountain section. One of the best crops to precede alfalfa is potatoes. A thoroughly prepared compact seed bed is necessary to successful seed germination and early growth. A previous application of lime at the rate of from one to two tons per acre is necessary. If the soil has not grown alfalfa very recently it should be inoculated. Broadcast over the field from 200 to 500 pounds of soil per acre from an alfalfa or a sweet clover field. Liberal quantities of acid rock phosphate and muriate of potash should be applied at the time of seeding.

Textbook References.—Buffum and Deaver, pp. 79, 87; Nolan, pp. 321, 326; Davis, 97, 109; Burkett, Stevens and Hill, pp. 238, 244.

Teachers' Reading.—Farmers' Bulletins Nos. 292, 339, 509, 515, 550, 578 and 589. The teacher should supplement the foregoing lesson with timely notes drawn from reading.

Practical Work.—(1) The teacher should take the pupils to a nearby farm where silage is being made. Pupils should take notes on the several steps in making and storing silage, using the following questions as a guide: (a) In what state is the corn? (b) What is the average length of the particles? (c) How is the silage forced into the silo? (d) How is it packed? (e) Other points of interest?

(2) Are there silos at the homes of any members of the class? If so, have the pupils from those homes report in writing replies to the foregoing questions.

Correlations.—Language: Have pupils provide themselves with well-bound note books. Transcribe the silage notes in this book.

Drawing: Make sketches of the different plants being used in the community for making silage, such as corn, peas, and soybeans.

Arithmetic: One cow consumes the silage from 5 square feet of surface to a depth of 2 inches each day. What should be the diameter of a silo to feed a herd of 10 cows? 15 cows? 20 cows?

If the silage is fed an average depth of 2 inches per day what should be the height of a silo to feed a herd 120 days? 150 days? 180 days?

If silage weighs an average of 35 pounds per cubic foot, how many tons in a silo 10 feet in diameter and 20 feet high? 14 feet in diameter and 30 feet high?

LESSON THREE.

Subject: Crops.
Topic: Selecting Seed Corn.

Select in the Field.—Corn should be selected in the field (a) to be able to determine the character of the stalk, its location with reference to other stalks, and the number and character of ears it bears and (b) to select and mark ears so that they may not become mixed with the general crop at harvesting time.

The Stalk.—The stalk (fig. 1) from which seed corn is to be selected should be one that approaches nearest the ideal under average field conditions. Do not be misled by an attractive,

symmetrical, highly productive stalk that happens to have good distance or an unusually fertile spot. Select the plant that has outstripped its neighbors under average conditions of distance and soil fertility. The stalk should be thrifty and of average height, strong and tapering, have strong brace roots and an abundance of leaves. It should bear at least one good ear located at a medium height—not too high nor too low, possessing

FIG. 1. UNDESIRABLE FOR SEED. EAR SHANK TOO SHORT. FAIR STALK. DESIRABLE FOR SEED.

moderately long shanks to enable the ear to point downward as it matures, close fitting shuck and well covered tips.

The Ear.—The ear (fig. 2) should be 9 to 11 inches long and its average circumference should be three-fourths the length. The cob should be medium sized, the rows of kernels should be straight and running well out to the tip and butt of the ear. The kernels should be long, approximately wedge-shaped, firmly set in place, and true to type as to denting and color.

Storing Seed.—When corn is being husked and hauled in from the fields care should be taken to collect in separate piles the marked ears, that is, if the corn is shocked. If it is left standing to mature, the marked ears should be collected in sacks as the corn is being harvested. The selected corn should then be racked and stored where it will not be exposed to extremes in temperature, excessive moisture, and attacks of insects, rodents and the like. If farm buildings are not equipped with a room

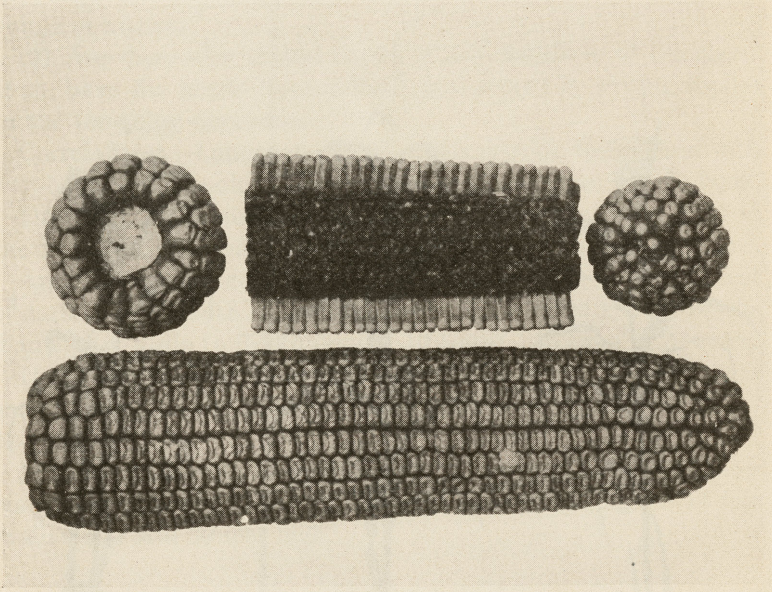

FIG. 2. IDEAL EAR, SHOWING TIP, BUTT AND PROPORTION OF COB TO GRAIN.

especially prepared for storing seed, the ears should be so racked that they may be suspended from points inaccessible to small animals. If at any time weevils or grain moths appear take the corn down, place it in a barrel and fumigate it with carbon bi-sulphide. The carbon bi-sulphide should be in a small dish and this placed on top of the corn in the barrel. Cover the barrel and let it stand for forty-eight hours. At the end of this time uncover the barrel and thoroughly air the corn. Take care that there is no fire near when the barrel is opened.

Textbook Assignment.—Nolan, Lesson 14; Burkett, Stevens and Hill, Section 19; Davis, pp. 131–138; Buffum and Deaver, Lesson 23.

Teachers' Reading.—Farmers' Bulletins Nos. 313, 415 and 537.

Practical Exercises.—(1) Teacher and pupils take trip to some club member's acre or nearby field. Select stalks and mark ears. (2) Have each member of the class bring to school a well-selected ear for study. Answer the following questions: What is the length of each ear? Circumference? Are the rows of kernels straight and do they extend out to the tip and butt? What is the shape of the kernels? Are they set firmly? Is the cob large, small or medium in size? All club members should select their seed corn this month.

Correlations.—Language: Require each member of the class to write up an account of the field trip. Also copy in the note book facts learned about the ears of corn studied at school.

Drawing: Make drawings of ideal and improper ears, ideal and ill-shaped grains.

Geography: Locate on the map the principal corn producing States and compare them with Maryland as to latitude, longitude and other agricultural industries.

History: Organize a boys' corn club and write to the Maryland Experiment Station and the United States Department of Agriculture for literature on corn club work.

Arithmetic: By selecting seed for three years in succession a corn club boy increased his yield 10 bushels per acre the third year. The time spent in selecting seed during three years was fifteen hours. What was the value of his time per hour if corn sells at 70 cents per bushel?

Have each club member in the class measure off a plat 20 feet by 20 feet in his acre of corn, count the stalks and ears and with these facts as a basis calculate the yield per acre.

LESSON FOUR.

Subject: Hogs.
Topics: Plan for Seasonal Pasture.

Pork can be produced much cheaper if pastures or forage crops are used along with corn and other feedstuffs. Blue grass is one of the most valuable pasture grasses for Maryland conditions.

However, blue grass is not found on every farm, and even when it is there are periods during the growing season when it should be supplemented with temporary grazing or forage crops.

(To teacher: Have each pupil make a copy of the accompanying chart and study it carefully.)

SUCCESSION OF CROPS FOR HOGS

FEEDING DATES	LOT I	LOT II	LOT III
	First Year.		
April 1–May 1.	Crimson clover and rye.		
May 1–July 1.		Winter barley. Winter oats. Vetch and red clover. Alsyke, Alfalfa.	
July 1–Aug. 15.			Rape or cowpeas sown separately or together.
Aug. 15–Dec. 15.		Red clover.	
Sept. 15–Dec. 15.	Corn.		
	Second Year.		
April 1–May 1.	Crimson clover and rye.		
May 1–July 1.			Winter oats. Winter barley and red clover.
July 1–Aug. 15.	Rape or cowpeas.		
Aug. 15–Dec. 15.			Red clover.
Sept. 15–Dec. 15.		Corn.	
	Third Year.		
April 1–May 1.		Crimson clover and rye.	
May 1–July 1.	Winter oats. Winter barley. Vetch and red clover.		
July 1–Aug. 15.		Rape or cowpeas.	
Aug. 15–Dec. 15.	Red clover.		
Sept. 15–Dec. 15.			Corn.

The foregoing chart provides for a three-year rotation in temporary pastures. By utilizing this plan grazing crops are made available for every month in the year except January, February and March. The area of each lot in the rotation depends upon the number of pigs to be kept. One acre of good soil should support ten to fifteen hogs.

All the crops provided for should be planted in the latter part of August and September, except corn, peas and rape. These, of course, should be planted after the grazing period in the spring. The first column of the chart shows the dates on which the crops immediately opposite are ready for pasturing. The second, third, and fourth columns show the crops to be grown on each of the lots during the three years.

Teachers' Reading.—Farmer's Bulletins Nos. 331 and 411; Maryland Agricultural Experiment Station Bulletins Nos. 150, 174 and 185. The teacher should supplement the foregoing lesson with timely notes from the suggestions found in these bulletins.

Practical Work.—Pig club members should prepare for winter and spring grazing during this month. If only one pig is to be raised, a small amount of forage will be necessary. But if it is the purpose of the club member to grow a spring litter of pigs forage crops for spring and summer grazing should be seeded now. Adapt the suggestions in this lesson to the needs of the individual case.

Correlations.—Language: Have the pupils copy in their note books the pasture plan given in the foregoing lesson.

Drawing: Draw to scale three grazing lots of an acre each. Have them lie side by side. Show the location of lanes and gates arranged conveniently for transferring hogs from one to the other.

Geography: Iowa, Illinois, Missouri, Indiana, Nebraska, Ohio, and Kansas are the seven States leading in the production of hogs. Locate these States on the map. What are the leading crops grown by these States. Is there any relation between the crops grown and raising hogs?

History: Organize a pig club. Emphasize the fact that corn club members should be pig club members so that profitable rotations may be practiced. Secure a copy of Farmers' Bulletin No. 566. Write to the Maryland Experiment Station for literature relating to clubs.

Arithmetic: Based on local prices find the cost of the material necessary to enclose the three pasture lots outlined in the drawing exercise. Set posts 8 feet apart and use 30-inch hog wire.

LESSON FIVE.

Subject: The Orchard.
Topic: Gathering Apples.

Importance.—The work of the orchardist is by no means at an end when his apples are ready to harvest. In fact the methods of gathering as well as of marketing the apples have as much to do with the profits realized as the methods of growing.

When the Apple Should Be Picked.—This is an important matter. To the grower too early or too late may mean failure. If picked too soon the fruit are undersized, poorly colored and inferior in quality. If allowed to hang on the tree too long the keeping and shipping qualities are impaired. Early picking reduces the danger from windfalls, yet on the other hand apples color better when left on the trees comparatively late. The time for picking red apples is generally judged by their color, and that for green apples by the color of their seeds. The latter is one of the most reliable indications of ripeness. A winter apple picked just as the seeds have turned a light brown and before they become dark around the edges is found to have not only full flavor, but also good keeping qualities. Red apples are frequently left on the tree after the seeds indicate maturity to allow them to take on more color. Bright days and frosty nights bring out color rapidly, even to fruit grown on the shady side of the tree. Some varieties such as Stayman's Winesap, Ben Davis' and Paragon may be left on the tree to good advantage, while Wealthy, Wagner and Rome would drop. Jonathan should be picked as soon as well colored or it will not keep in storage. Much of the complaint lodged against the Jonathan for not keeping well in storage is probably due to late picking.

Picking the Fruit.—The way from the orchard to the market is likely to be a bumpy one and unless properly safeguarded the apple receives bruises that depreciate its value. Apples should be picked carefully. They should not be jerked or shaken off the tree. Such action destroys fruit spurs and injures the fruit.

If the stems are pulled out or the skin broken rot fungi are likely to enter and the keeping qualities impaired. The hand should grasp the apple firmly but gently, with the thumb pressing the stem against the side of the fruit, then with a sharp bend the stem unjoints from the fruit spur. The apple should then be laid in the receptacle, not thrown or dropped.

Receptacles.—Buckets, baskets, bags or aprons are in general use. The padded half-bushel basket with swing handle and wire hook to hang on limbs is probably the best. In case of apron or bag the weight is continually on the picker and there is also danger of bruising the fruit while pushing or leaning against the limbs or ladder.

Textbook Reference.—Nolan, pp. 60–64; Davis, pp. 200–201; Buffum and Deaver, pp. 167–169.

Teachers' Reading.—Maryland Agricultural Experiment Station Bulletin No. 144; Farmers' Bulletin No. 113.

Practical Exercises.—(1) Take a trip with the class to observe a progressive farmer gathering apples. Require the pupils to take notes on the observations. Note the ladders and receptacles used and the manner in which the fruit is removed from the spurs. Are the apples over-ripe, under-ripe, or in the proper condition? (2) Have members of the class bring to school several varieties of recently picked apples. Study them to give the pupils practice in recognizing varieties; to determine whether or not they have been properly picked and whether or not they are at the proper stage of ripeness.

Pupils having home project or club work with apples should make reports on their methods of picking apples. Write to the Maryland Experiment Station for literature on apple clubs.

Correlations.—Language: Require pupils to write out in full the notes taken while visiting the orchard and those taken in connection with the study of the different varieties at school. Carefully copy these in the note books.

Drawing: Make sketches of the different kinds of receptacles used in the community for gathering apples.

Geography: Locate on the map the principal markets for the apple crop of the community.

History: Study the principal varieties of apples grown in the community, as dates when introduced, dates of ripening, success with which grown and keeping qualities.

Arithmetic: Have pupils of the class report the yields of the orchards at the homes of the pupils and from these facts develop problems. Compare varieties as to yields.

LESSON SIX.

Subject: Vegetable and Fruit Gardening.
Topics: (1) The Home Garden. (2) Small Fruits.

The Home Garden: Saving Seeds.—Many garden plants are maturing seed this month, hence it is the proper time to select for future planting. Select plants (fig. 3) that are well developed

Fig. 3. Ideal Plants and Choice Fruit From Which to Select Seed Tomatoes.

and healthy under normal conditions, but not those having enjoyed abnormally favorable conditions. When the fruit is fully matured or the seed thoroughly ripe carefully pick the best specimens. Dry seeds are easily shelled out and stored. Pulpy specimens like the tomato should be crushed in a suitable vessel and let stand for a few days until they ferment. Then fill the vessel with water and let stand a few hours to settle. The pulp will rise to the top and can be poured off with the water, leaving

the seed in the bottom. The seed should be given a second washing by adding water, letting it stand as before, and then pouring it off. The seed should now be placed on a fine sieve or a thin cloth and let dry. Take care to put the seed where mice or birds cannot get it. When the seed is dry put it in thin cotton bags and hang up in a warm dry room to insure thorough drying. Glass jars are very satisfactory for permanent places in which to store vegetable seeds.

FIG. 4. a, SECONDS; b, FIRSTS; c, WELL ARRANGED AND WELL CRATED.

Planting Fall Vegetables.—Spinach, kale and turnips may yet be sown in the southern counties of the State. Sow Jersey Wakefield cabbage seed that plants may be had for fall setting. Also sow Big Boston lettuce to secure plants to be grown in the cold frame. A cold frame can be constructed at very little expense and by its use a supply of lettuce may be provided through a large part of the winter. Prepare the ground for setting fall cabbage. An abundance of well rotted manure should be plowed in.

Small Fruit.—Fall bearing strawberries may be picked every two or three days through this month. Great care should be exercised in picking (fig. 4) and packing. The fruit stems should be pinched off carefully without bruising or even pressing on the berry with the hand. The baskets should be clean, new and well filled with berries. It pays to put a good product in good condition on the market.

The final picking should be followed by mowing the patch and burning the grass as soon as it is sufficiently dry. This destroys foul matter, fungeous diseases and insects. Plow between the rows throwing the furrows together in the middle and thin the plants. Cultivate the ground level between the rows.

Grapes to sell well on the market must present an attractive appearance. Hence extreme care should be exercised in handling. The bunches should be removed with picking shears and should be handled by the stem to avoid destroying the "bloom." After picking the grapes should be carried to the packing shed and all green and defective berries should be removed. So fill the basket that some pressure must be applied to bring the lid in place.

Textbook References.—Buffum and Deaver, pp. 154 and 185; Davis, pp. 173, 196 and 199.

Teachers' Reading.—Farmers' Bulletins Nos. 154, 471, 255, and 198; Maryland Agricultural Experiment Station Bulletins Nos. 160, 182, 180 and 116.

Practical Exercises.—(1) Have pupils bring to school choice specimens of tomatoes, cucumbers, and mature beans. Select those specimens that are suitable for seed and store them. (2) If fall strawberries and grapes are grown in the community accompany the pupils to a nearby farm and give them practice in picking and arranging in baskets. If practicable have berries brought to school and give pupils a practical lesson in arranging them in baskets.

Correlations.—Language: Have tomato club members submit written reports as to their work for the year.

Drawing: Tomatoes, strawberries, cucumbers, and grapes in cluster supply excellent drawing material.

Geography: If any one of the before mentioned vegetables or fruits is grown in the community for the market answer the following questions: Is there a farmers' marketing club? What is the shipping point? To what market shipped? Is the fruit

or vegetable utilized by a local cannery? Trace on the map the route the shipment takes from the community to the market.

History: Have each pupil of the class write an account of the introduction, development and the success with which any one of the before mentioned crops has been grown in the community. Organize tomato clubs.

Arithmetic.—Have the pupils gather data at their homes with reference to the foregoing crops as to quantities sold and prices received. From these develop problems adapted to the advancement of the pupils. Problems should also be developed from reports of tomato club members.

LESSON SEVEN.

Subject: Poultry.
Topic: Houses.

Site.—The house (fig. 5) should be situated in a convenient place as the chickens require attention several times during the day. A rich, sandy, well drained soil is best. If the ground is damp the chickens are subject to roup, rheumatism, and the like. If it is wet and muddy the hens soil their eggs with dirty feet. A southern or southeastern slope of the land should be chosen if possible as such a site is naturally warmer, and also protected from the north winds.

The House.—The house (fig. 5) should be so constructed as to be convenient to the attendant, cheerful to the birds, dry, well ventilated, free from draughts, and should be economical of construction. The styles of poultry houses are: colony, and long or continuous. Colony houses are used most. They are so called because they shelter one flock or colony. They may be made portable. This admits of their being moved from one place to another and reduces the likelihood of disease. There are three kinds of floors used: dirt, board or cement. Sometimes a dirt floor is inclined to be damp. In this case a layer of coarse material like rocks or broken bricks must be put in to keep the earth floor dry. The same is true if cement is to be used on a damp site. The advantages of a cement floor are that it can be cleaned easily and lasts well. A dirt floor is cheap and furnishes a dust bath for the birds, but it is hard to clean and diseases are sometimes bred in the filth. A board floor is very good except that rats may get under it and cold winds sometimes blow up

through it. A simple way to construct the walls is to use a single layer of boards with paper on the outside. A double wall with air space between is sometimes used. This latter, however, is most always damp. There are several kinds of roofs, but the most popular one is the shed roof. It is simple to construct, inexpensive, and if made high in front light is admitted and room is provided for the poultry attendant to move about freely. The rear should be made low for too much air space in a house makes it cold in winter. The size of the house depends upon the number of birds to be housed. Four square feet of floor space

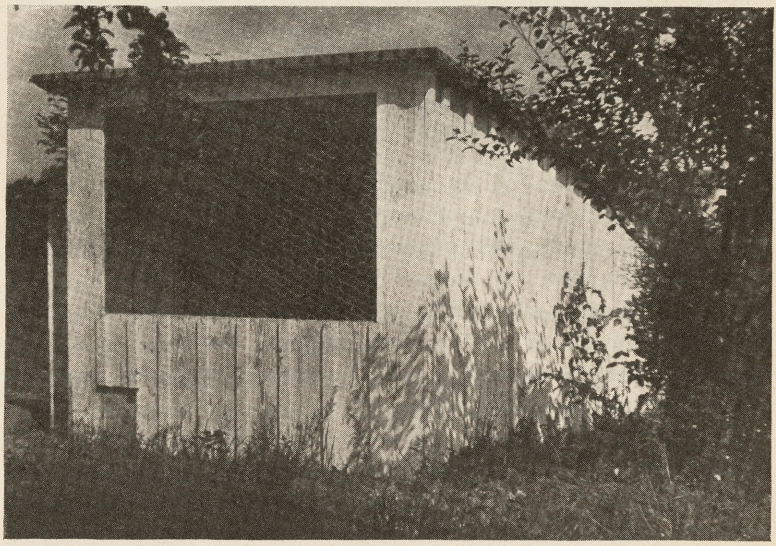

FIG. 5. POULTRY HOUSE ADAPTED TO MARYLAND CONDITIONS.

is about average for each fowl, when small flocks are kept, and they have to be kept inside a great deal.

The Accessories of the poultry house are roosts, nests, food troughs, drinking vessels (fig. 6) and droppings boards. From 6 to 10 inches of roost space should be given each bird. All the roosts should be on the same level to prevent birds fighting for the highest points. Nests should be 10 inches by 12 inches or larger, depending upon the size of the fowls. Ventilation of the poultry houses is very important. A lack of ventilation causes dampness, foul air, and a consequent weakness in the fowls. A large part of the front and the front only should be entirely open.

This permits an interchange of air by diffusion and eliminates the possibility of a draught. Even with this arrangement the house should be at least 14 feet deep and the roosts placed in the rear. On very cold or stormy nights a muslin curtain can be let down over the opening in the front. The feed hoppers and drinking vessels should be convenient, sanitary and of sufficient size.

Textbook References.—Davis, pp. 288–291; Burkett, Stevens and Hill, p. 282; Nolan, p. 110.

Teachers' Reading.—Farmess' Bulletins Nos. 287 and 528; Maryland Agricultural Experiment Station Bulletin No. 171. Supplement the lesson with timely notes.

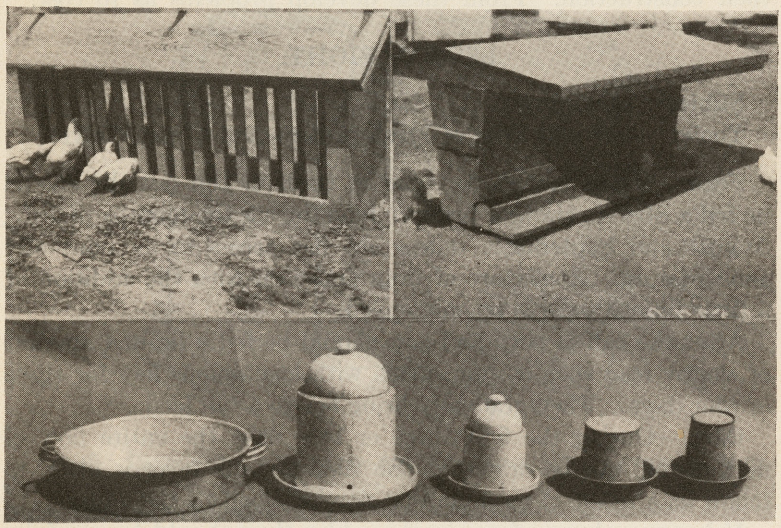

Fig. 6. a, Protected Drinking Trough; b, Protected Feed Trough; c, Types of Drinking Fountains.

Practical Exercises.—(1) Make a study of the poultry houses of the community. Have each member of the class report in detail as to the poultry houses at his own home and at the homes of his immediate neighbors. (2) Make a simple drinking fountain after the following directions: With a nail make a hole in the side of a tin can about half an inch from the open end. Fill the can quite full of water and place over it a pan about two inches deep. Quickly invert both. The water should stand in the pan as high as the nailhole in the can. This will show the principle of certain drinking fountains.

Poultry club members should prepare housing facilities and accessories for their flocks.

Correlations.—Language: Require the pupils to make in writing their reports on poultry houses in the community. These reports should be copied in the note books.

Drawing: Require drawings of feed troughs, drinking vessels and other poultry house accessories.

Arithmetic: Find the cost of materials given on pages 90, 92 and 93 of Maryland Agricultural Experiment Station Bulletin No. 171. Have the pupils furnish facts from their homes with reference to dimensions of poultry houses and materials used in their construction. From these develop problems as to cost.

LESSON EIGHT.

Subject: Dairying.

Topic: Care and Feed of Fresh Milkers and Young Calves.

Feed.—If the cow is to come in fresh in the fall she should be fed a liberal ration of laxative food during the months of July, August and September, unless she has access to an unusually good pasture. A mixture of bran and corn with the addition of a little linseed meal is recommended.

After the calf is born and cow should be fed a limited amount of sloppy feed such as bran mash with leguminous hay for three or four days. Then gradually bring her to a full feed.

Care.—During the first three or four days the entire flow of milk should not be drawn at one time as milk fever is likely to follow as a result of an abnormal flow of blood to the udder.

If knots or lumps form in the udder they should be carefully removed by rubbing or massaging. In aggravated cases alternate applications of hot and cold water should be applied to the udder.

Milk Fever. Symptoms: (1) The cow becomes apparently paralyzed almost all over the body. This is specially noticeable in the limbs. (2) The head is held at one side seemingly in an effort to see the udder. Milk fever develops in from one to four days after the calf is born.

Treatment: Draw the milk from the udder and pump it full of air using a milk tube and a bicycle pump (fig. 7). When the quarter is well filled with air tie the teat with tape or a strip of cloth to prevent the air escaping. The air should be kept in the udder twenty-four hours or longer.

The Young Calf.—For the first few days the calf should get nourishment from the cow. After this separate the calf from the cow and feed it her milk. The calf should be fed three times a day and be given 1–1½ pounds of milk at each feed. This should be kept up for at least three weeks. The calf may be taught to drink milk by putting his head in the pail and forcing his mouth open with the fingers. After the calf becomes three weeks old whole or skim milk should be continued and this supplemented with corn meal and a good quality of hay. If skim milk is to be fed the change from whole milk should be gradual requiring about a week to make the change. The calf may be taught

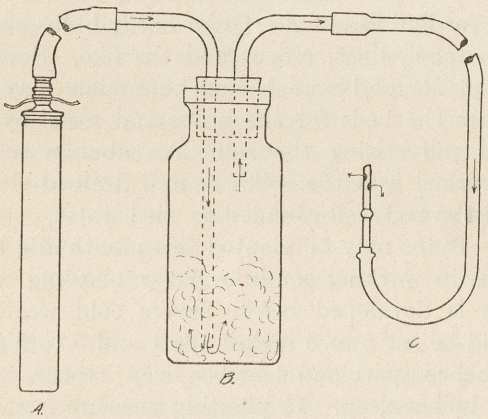

FIG. 7. IMPROVISED APPARATUS FOR TREATING MILK FEVER: A, BICYCLE PUMP; B, BOTTLE CONTAINING COTTON; C, RUBBER TUBING WITH MILK TUBE AT THE END.

to eat meal by rubbing small amounts on its nose. This causes the calf to lick the meal and cultivate a taste for it.

Textbook References.—No particular material is given in the textbooks on this phase of the subject.

Teachers' Reading.—Maryland Agricultural Experiment Station Bulletins Nos. 169, 181; Farmers' Bulletin No. 280.

Practical Exercises.—(1) Let each pupil select a young calf at his or her own home and care for it along the lines suggested in the foregoing lesson. Teach it to drink milk and to eat meal. (2) The care of a calf for a year or longer provides a splendid project for a pupil.

Correlations.—Language and Drawing: Draw and describe the equipment necessary to treat milk fever.

Arithmetic: Develop problems on the amount and value of whole milk necessary to feed a calf until it is three weeks old. Ten calves.

LESSON NINE.

Subject: Flower Gardening.
Topic: Home and School.

Care of Growing Flowers.—The weather is usually fine this month and very little attention is required, but on nights when frosts threaten cover the flower beds and plants.

Preparing for Fall Planting.—Order hardy bulbs such as tulips, hyacinths, narcissi, lilies, crocus and the like. Seeds, cuttings, and rooted plants of biennials and perennials may be ordered now. Prepare the beds for the bulbs and seeds by thoroughly spading and pulverizing the soil. An abundance of manure should be worked into the soil. A well drained site should be selected and the bed well rounded to shed water.

Planting.—Bulbs may be planted this month and later so long as the soil is in working condition. By planting early a good root growth is developed before severe cold weather sets in. Tulips should be set 5 to 6 inches apart and 5 to 6 inches deep; narcissi, 6 inches apart and 4 inches deep; crocus, 2 to 4 inches apart and 2 inches deep. In planting measure from the surface of the ground to the top of the bulb. Bulbs may be used either for beds or borders. Crocus and other low-growing kinds give pleasing effects when planted on the lawn.

Handling Dormant Plants.—Plants that have finished active growth and are through flowering may be lifted and divided. Use a sharp spade or knife in dividing the roots or underground stems and see to it that each division has several eyes or buds. Such plants as the peony should be divided with a knife so that there is at least one bud with each division. The divisions should be reset where wanted. Seeds of biennials and perennials may be sown the latter part of the month.

Textbook References.—Davis, p. 180; Nolan, p. 244; Burkett, Stevens and Hill, p. 108; Buffum and Deaver, p. 260.

Teachers' Reading.—Farmers' Bulletins Nos. 218, 134, 185. Write to the Maryland Experiment Station for plans of home and school yards.

Practical Exercises.—Lay out the flower beds at the school and at the homes. Order seeds, bulbs and plants. Prepare and fertilize the beds and plant.

Correlations.—Language: Have the pupils write letters ordering catalogues and flower seeds.

Drawing: Draw to scale the flower garden locating the different beds and borders.

LESSON TEN.

Subject: Management Suggestions.

Crops.—Cut and shock corn. This may be done by hand, with the harvester or with any one of a number of corn cutters. The method employed depends upon the amount of corn and the other work to be done on the farm at this season. The proper stage at which corn should be cut is indicated by the bottom blades and the outer husks becoming dry.

Begin sowing wheat this month in the western part of the State. Wheat and vetch or oats and vetch for spring grazing should be sown this month. Either one of these combinations should follow hay stubble and precede corn.

Buckwheat should be harvested when the first grains are matured.

Farm Animals.—This is the month to lay out and start a continuous hog pasture. If a permanent blue grass pasture is not feasible, plan a rotation as suggested in the lesson of this month. A fall crop of rape is possible in the southern portions of Maryland. If there is corn to be hogged down, turn the hogs in the field as soon as the grains have become dented.

All cattle should have access to permanent pastures, sheep should graze the wheat stubble, and a patch of early rye or oats should be sown to provide grazing for poultry.

The wheat stubble should be mowed often so that the growth will be sufficiently tender to be utilized as a hay for wintering live stock. Nothing in the way of forage should be allowed to go to waste.

Horticulture.—Begin gathering apples as they ripen. Those on the outer branches ripen first and should be gathered before they are over-ripe and lose their keeping qualities.

Fall strawberries should be picked as often as every two or three days. Continue picking until frost. Fruiting canes of raspberries and blackberries should be removed. Also clean

out and burn the weeds. Trim out new canes and burn them along with other rubbish.

The fall garden should be given attention. Care for growing plants. Some of the border plants may be sown during the first of September, especially in the southern parts of the State. This is the month to select vegetable seeds.

REFERENCES.

Teachers should provide themselves with the literature referred to in the foregoing lessons. These publications may be had free and much of the value of these lessons is lost if the references are not utilized.

Write the Division of Publications, United States Department of Agriculture, Washington, D. C., for the following: Farmers' Bulletins Nos. 113, The Apple and How to Grow It; 134, Tree Planting on Rural School Grounds; 154, The Home Fruit Garden: Preparation and Care; 185, Beautifying the Home Grounds; 198, Strawberries; 218, The School Garden; 255, The Home Vegetable Garden; 280, A Profitable Tenant Dairy Farm; 287, Poultry Management; 292, Cost of Filling Silos; 313, Harvesting and Storing Corn; 331, Forage Crops for Hogs in Kansas and Oklahoma; 339, Alfalfa; 411, Feeding Hogs in the South; 415, Seed Corn; 427, Barley Culture in the United States; 515, Vetches; 528, Hints to Poultry Raisers; 537, How to Grow an Acre of Corn; 550, Crimson Clover: Growing the Crop; 562, The Organization of Boys' and Girls' Poultry Clubs; 566, Boys' Pig Clubs; 578, The Making and Feeding of Silage; 586, Collection and Preservation of Plant Material for Use in the Study of Agriculture; 589, Home-made Silos; 606, Collection and Preservation of Insects and Other Material for Use in the Study of Agriculture; 617, School Lessons on Corn. Also United States Department of Agriculture Bulletin 132, Correlating Agriculture With the Public School Subjects in the Southern States.

Write to the Maryland Experiment Station, College Park, Md., for the following: Bulletins Nos. 144, Apple Culture; 150, Pig Feeding Experiments and Two Kinds of Hog Houses; 157, Some Experiments with Poultry; 160, Strawberries; 169, Cow-testing Association; 171, Poultry Notes; 174, Hog Cholera; 180, Tomatoes: Varieties, Diseases, Culture; 181, Inexpensive Aids in Producing Sanitary Milk; and 182, Small Fruits.